SEQUENCE LISTING

<110> Herman, Ira
      Welch, Alice

<120> BETA-CAP73 CONTROL OF NORMAL AND
      ABNORMAL CELL MIGRATION

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<141> 2000-12-28

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gctgttagca acaagaaact aaatcctgtc t atg atg agc tgt tgg ttt tct   412
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tgt gct cct aag aac aga caa gca gca gat tgg aac aaa tac gat gac   460
Cys Ala Pro Lys Asn Arg Gln Ala Ala Asp Trp Asn Lys Tyr Asp Asp
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cga ttg atg aga gca gca gaa agg gga gat gta gaa aaa gtg tcc tca   508
Arg Leu Met Arg Ala Ala Glu Arg Gly Asp Val Glu Lys Val Ser Ser
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atc ctt gct aaa aag gga gtc aat cca ggc aag cta gat gta gaa ggc   556
Ile Leu Ala Lys Lys Gly Val Asn Pro Gly Lys Leu Asp Val Glu Gly
40   45   50   55

aga tct gcc ttt cat gtt gtg gcc tca aag gga aat ctt gag tgt ttg   604
Arg Ser Ala Phe His Val Val Ala Ser Lys Gly Asn Leu Glu Cys Leu
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aat gcc atc ctc ata cat gga gtt gat att aca acc agt gac acc gca   652

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gga agg aat gct ctt cac ctg gct gca aag tat ggg cat gca ctg tgt   700
Gly Arg Asn Ala Leu His Leu Ala Ala Lys Tyr Gly His Ala Leu Cys
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cta caa aaa ctt cta cag tac aat tgt ccc act gaa cat gta gac ctg   748
Leu Gln Lys Leu Leu Gln Tyr Asn Cys Pro Thr Glu His Val Asp Leu
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cag gga aga act gca ctt cat gat gca gct atg gca gac tgt cct tct   796
Gln Gly Arg Thr Ala Leu His Asp Ala Ala Met Ala Asp Cys Pro Ser
120             125             130             135

agc ata cag ctg ctc tgc gac cat ggg gcc tcg gtg aat gcc aaa gat   844
Ser Ile Gln Leu Leu Cys Asp His Gly Ala Ser Val Asn Ala Lys Asp
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gta gat ggg cgg aca cca ctt gtt ctg gct acc cag atg tgt agg cca   892
Val Asp Gly Arg Thr Pro Leu Val Leu Ala Thr Gln Met Cys Arg Pro
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aca ata tgt caa ctg ctg ata gat aga ggg gcg gat att aat tcc aga   940
Thr Ile Cys Gln Leu Leu Ile Asp Arg Gly Ala Asp Ile Asn Ser Arg
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gac aaa caa aac agg act gct ctc atg cta gga tgc gag tat ggt tgc   988
Asp Lys Gln Asn Arg Thr Ala Leu Met Leu Gly Cys Glu Tyr Gly Cys
        185             190             195

aaa gat gca gta gaa gtc tta atc aaa aac ggc gct gac gtg acc ttg  1036
Lys Asp Ala Val Glu Val Leu Ile Lys Asn Gly Ala Asp Val Thr Leu
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ctg gac gcc ctt ggc cat gac agt tct tac tat gca aga att ggt gac  1084
Leu Asp Ala Leu Gly His Asp Ser Ser Tyr Tyr Ala Arg Ile Gly Asp
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aat ctg gac att cta acc tta ctg aag act gca tca gaa aat tcc aac  1132
Asn Leu Asp Ile Leu Thr Leu Leu Lys Thr Ala Ser Glu Asn Ser Asn
            235             240             245

aaa ggg aga gaa ctt tgg aag aaa gga cca tct tta caa cag cga aat  1180
Lys Gly Arg Glu Leu Trp Lys Lys Gly Pro Ser Leu Gln Gln Arg Asn
            250             255             260

ttg tct cag atg cta gat gaa gta aat acg aag tca aat cag agg gag  1228
Leu Ser Gln Met Leu Asp Glu Val Asn Thr Lys Ser Asn Gln Arg Glu
        265             270             275

cat caa aac att cag gat ctg gag att gaa aat gaa gat ctg aaa gag  1276
His Gln Asn Ile Gln Asp Leu Glu Ile Glu Asn Glu Asp Leu Lys Glu
280             285             290             295

aga ttg aga aaa att cag caa gaa cag aga ata tta ttg gat aaa gtc  1324
Arg Leu Arg Lys Ile Gln Gln Glu Gln Arg Ile Leu Leu Asp Lys Val
            300             305             310

aat ggt tta cag cta cag ctg aat gag gaa gta atg gtg gct gat gat  1372
Asn Gly Leu Gln Leu Gln Leu Asn Glu Glu Val Met Val Ala Asp Asp
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ctg gaa agt gag aaa gaa aag ctg aag tcc ctt ttg gca gcc aaa gaa    1420
Leu Glu Ser Glu Lys Glu Lys Leu Lys Ser Leu Leu Ala Ala Lys Glu
        330             335             340

aag cag cat gaa gaa agc cta aga act att gag gct ctg aaa agt aga    1468
Lys Gln His Glu Glu Ser Leu Arg Thr Ile Glu Ala Leu Lys Ser Arg
        345             350             355

ttt aag tat ttt gag agt gat cat tta gga tca gga agt cat ttc agg    1516
Phe Lys Tyr Phe Glu Ser Asp His Leu Gly Ser Gly Ser His Phe Arg
360             365             370             375

aaa gaa gat atg ctt ctt aaa caa ggt caa atg tac atg aca gac tca    1564
Lys Glu Asp Met Leu Leu Lys Gln Gly Gln Met Tyr Met Thr Asp Ser
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cag tgt act tcc aca ggc atg cca gtc cat atg caa agc cga tct atg    1612
Gln Cys Thr Ser Thr Gly Met Pro Val His Met Gln Ser Arg Ser Met
            395             400             405

tta aga cca ctg gag cta gcc tta cct aat caa gcc tca tat tcg gaa    1660
Leu Arg Pro Leu Glu Leu Ala Leu Pro Asn Gln Ala Ser Tyr Ser Glu
        410             415             420

aac gaa att tta aag aaa gaa tta gaa gca atg aga act ttc tgt gat    1708
Asn Glu Ile Leu Lys Lys Glu Leu Glu Ala Met Arg Thr Phe Cys Asp
        425             430             435

tca gca aaa caa gac aga ctc aaa ctc caa aat gaa ctg gct cac aag    1756
Ser Ala Lys Gln Asp Arg Leu Lys Leu Gln Asn Glu Leu Ala His Lys
440             445             450             455

gtg gcg gag tgc aag gcc tta gca ttg gaa tgt gaa agg gtg aaa gag    1804
Val Ala Glu Cys Lys Ala Leu Ala Leu Glu Cys Glu Arg Val Lys Glu
            460             465             470

gat tca gat gag cag ata aag caa cta gaa gat gcc ttg aaa gac gtg    1852
Asp Ser Asp Glu Gln Ile Lys Gln Leu Glu Asp Ala Leu Lys Asp Val
            475             480             485

cag aag aga atg tat gag tcg gaa ggt aaa gtg aaa caa atg cag aca    1900
Gln Lys Arg Met Tyr Glu Ser Glu Gly Lys Val Lys Gln Met Gln Thr
            490             495             500

cat ttt ctt gcc ttg aaa gag cac ctg aca agt gat gcg gcc act ggg    1948
His Phe Leu Ala Leu Lys Glu His Leu Thr Ser Asp Ala Ala Thr Gly
        505             510             515

aac cac agg ctg atg gag gaa ctg aag gat cag ttg aaa gac atg aaa    1996
Asn His Arg Leu Met Glu Glu Leu Lys Asp Gln Leu Lys Asp Met Lys
520             525             530             535

gtg aaa tac gaa ggt gcg tcc gca gaa gtg ggg aaa ttg aga aac caa    2044
Val Lys Tyr Glu Gly Ala Ser Ala Glu Val Gly Lys Leu Arg Asn Gln
            540             545             550

atc aaa caa aat gaa atg tta gtt gaa gag ttt aag aga gat gag ggc    2092
Ile Lys Gln Asn Glu Met Leu Val Glu Glu Phe Lys Arg Asp Glu Gly
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aag ctg atg gaa gag aat aag cga ctg cag aag gag ttg agc atg tgt    2140
Lys Leu Met Glu Glu Asn Lys Arg Leu Gln Lys Glu Leu Ser Met Cys
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gaa ctg gag cga gag aag aga gga agg aag ctc act gag atg gaa ggc    2188
Glu Leu Glu Arg Glu Lys Arg Gly Arg Lys Leu Thr Glu Met Glu Gly
    585             590             595

cag tta aag gac ttg tca gcc aag ctg gcc ctt tct att cca gca gag    2236
Gln Leu Lys Asp Leu Ser Ala Lys Leu Ala Leu Ser Ile Pro Ala Glu
600             605             610             615

aaa ttt gaa aac atg aag agc ttg tta tca aat gaa ctg aac gag aag    2284
Lys Phe Glu Asn Met Lys Ser Leu Leu Ser Asn Glu Leu Asn Glu Lys
            620             625             630

gca aaa aaa tta ata gat gtg gaa aga gaa tat gaa aga tca ctt aat    2332
Ala Lys Lys Leu Ile Asp Val Glu Arg Glu Tyr Glu Arg Ser Leu Asn
            635             640             645

gaa act aga cca tta aag aga gaa ctt gag aat ttg aag gcc aaa ctg    2380
Glu Thr Arg Pro Leu Lys Arg Glu Leu Glu Asn Leu Lys Ala Lys Leu
        650             655             660

gct cag cac gtc aaa cca gag gaa cat gag cag ctc aag agc aga tta    2428
Ala Gln His Val Lys Pro Glu Glu His Glu Gln Leu Lys Ser Arg Leu
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gag cag aag tca gga gaa ctt ggg aag agg atc act gag tta aca tcg    2476
Glu Gln Lys Ser Gly Glu Leu Gly Lys Arg Ile Thr Glu Leu Thr Ser
680             685             690             695

aaa aat cag acg tta caa aag gaa atc gaa aag gtc tgc ctg gat aat    2524
Lys Asn Gln Thr Leu Gln Lys Glu Ile Glu Lys Val Cys Leu Asp Asn
            700             705             710

aag ctc ctt aca caa caa gta aat aac tta aca act gaa atg aaa aat    2572
Lys Leu Leu Thr Gln Gln Val Asn Asn Leu Thr Thr Glu Met Lys Asn
            715             720             725

gtc cct tta aaa gta agt gaa gaa atg aaa aag tca cat gat gta att    2620
Val Pro Leu Lys Val Ser Glu Glu Met Lys Lys Ser His Asp Val Ile
        730             735             740

gtt gat gat ttg aat aaa aag ctt tca gat gtg aca cac aaa tat aca    2668
Val Asp Asp Leu Asn Lys Lys Leu Ser Asp Val Thr His Lys Tyr Thr
    745             750             755

gaa aag aag ttg gaa atg gag aag ttg ctt atg gaa aat gcc agt tta    2716
Glu Lys Lys Leu Glu Met Glu Lys Leu Leu Met Glu Asn Ala Ser Leu
760             765             770             775

agt aaa aat gtc agc cgc ctg gaa act gtg ttc ata cct ccc gag aga    2764
Ser Lys Asn Val Ser Arg Leu Glu Thr Val Phe Ile Pro Pro Glu Arg
            780             785             790

cac gaa aaa gaa atg atg gct ctg aaa tcc aat atc act gaa ctt aag    2812
His Glu Lys Glu Met Met Ala Leu Lys Ser Asn Ile Thr Glu Leu Lys
        795             800             805
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aag cag ctg tct gaa ctt aat aaa aaa tgt ggt gaa gac caa gag aaa    2860
Lys Gln Leu Ser Glu Leu Asn Lys Lys Cys Gly Glu Asp Gln Glu Lys
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ata tat tca ctc atg tct gaa aac aat gat ttg aaa aag acc atg agt    2908
Ile Tyr Ser Leu Met Ser Glu Asn Asn Asp Leu Lys Lys Thr Met Ser
        825             830             835

cat cag tat gtg ccc gtg aaa acc cat gaa gag att aaa act gcc ttg    2956
His Gln Tyr Val Pro Val Lys Thr His Glu Glu Ile Lys Thr Ala Leu
840             845             850             855

agt agc aca ttg gat aaa acc aat aga gaa tta gta gat gtg aag aag    3004
Ser Ser Thr Leu Asp Lys Thr Asn Arg Glu Leu Val Asp Val Lys Lys
                860             865             870

aag tgt gaa gat ata aat caa gaa ttt gtg aaa ata aaa gat gag aac    3052
Lys Cys Glu Asp Ile Asn Gln Glu Phe Val Lys Ile Lys Asp Glu Asn    '
                875             880             885

gaa ata tta aaa aga aat ctg gag aac act cag aac caa gta aaa gct    3100
Glu Ile Leu Lys Arg Asn Leu Glu Asn Thr Gln Asn Gln Val Lys Ala
        890             895             900

gag tac atc agc cta aga gag cat gaa gaa aag atg agt ggc cta agg    3148
Glu Tyr Ile Ser Leu Arg Glu His Glu Glu Lys Met Ser Gly Leu Arg
        905             910             915

aag agc atg aag aag gtc cag gac aac agc gct gaa ata ctg gct aag    3196
Lys Ser Met Lys Lys Val Gln Asp Asn Ser Ala Glu Ile Leu Ala Lys
920             925             930             935

tac aaa aaa agc cag gag gag att gtc acc ctg cat gag gag att gca    3244
Tyr Lys Lys Ser Gln Glu Glu Ile Val Thr Leu His Glu Glu Ile Ala
                940             945             950

gcc cag aag aga gaa ctc gac acg ata cag gaa tgc atc aag cta aaa    3292
Ala Gln Lys Arg Glu Leu Asp Thr Ile Gln Glu Cys Ile Lys Leu Lys
                955             960             965

tat gct ccg atc atc agc ttg gaa gag tgt gag aga aaa ttt aaa gcc    3340
Tyr Ala Pro Ile Ile Ser Leu Glu Glu Cys Glu Arg Lys Phe Lys Ala
        970             975             980

act gag aaa gaa cta aaa gaa cag cta tcc cag cag aca cag aag tat    3388
Thr Glu Lys Glu Leu Lys Glu Gln Leu Ser Gln Gln Thr Gln Lys Tyr
        985             990             995

aat  acc agt gaa gaa gag  gcc aag aag tgc aag  caa gag aat gac aag    3436
Asn  Thr Ser Glu Glu Glu  Ala Lys Lys Cys Lys  Gln Glu Asn Asp Lys
1000             1005            1010            1015

tta aag aag gag atc  ctc act ctt cag aag  gat cta aag gat aag  aat    3484
Leu Lys Lys Glu Ile  Leu Thr Leu Gln Lys  Asp Leu Lys Asp Lys  Asn
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gtt cac att gag  aat tct tat gaa aca  gaa aga gca tta agc  aga aaa    3532
Val His Ile Glu  Asn Ser Tyr Glu Thr  Glu Arg Ala Leu Ser  Arg Lys
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aca gaa gag  ctg aac aga cag tta  aaa gac ctg ttg cag  aaa tac aca    3580
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gag gca   aag aag gag aaa gag   aag ctc gtg gag gaa   aat gcc aag cag   3628
Glu Ala   Lys Lys Glu Lys Glu   Lys Leu Val Glu Glu   Asn Ala Lys Gln
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act tct gag atc ctt gca   gca caa act ctt ttg   cag aag cag cat gtt   3676
Thr Ser Glu Ile Leu Ala   Ala Gln Thr Leu Leu   Gln Lys Gln His Val
1080   1085   1090   1095

ccg ctg gag cag gtt   gag tcc ctg aaa aaa   tct ctt agt ggt aca   atc   3724
Pro Leu Glu Gln Val   Glu Ser Leu Lys Lys   Ser Leu Ser Gly Thr   Ile
         1100   1105   1110

gag aca ctc aag   gaa gaa ctg aaa act   aag cag aga tgt tat   gag aaa   3772
Glu Thr Leu Lys   Glu Glu Leu Lys Thr   Lys Gln Arg Cys Tyr   Glu Lys
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gag cag cag   aca gtg acc caa ctg   cgg cag atg ctg gag   aat cag aag   3820
Glu Gln Gln   Thr Val Thr Gln Leu   Arg Gln Met Leu Glu   Asn Gln Lys
       1130   1135   1140

aac tcc tct gtg ccc ctg gct   gag cat ttg cag gtt   aag gaa gca ttt   3868
Asn Ser Ser Val Pro Leu Ala   Glu His Leu Gln Val   Lys Glu Ala Phe
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gag   aaa gaa gtt gga atc   ata aaa gct agc ttg   aga gaa aag gaa gaa   3916
Glu   Lys Glu Val Gly Ile   Ile Lys Ala Ser Leu   Arg Glu Lys Glu Glu
1160   1165   1170   1175

gaa agc caa aac aaa   act gaa gag gtc tcc   aaa ctc cag tct gag   att   3964
Glu Ser Gln Asn Lys   Thr Glu Glu Val Ser   Lys Leu Gln Ser Glu   Ile
         1180   1185   1190

cag aat act aaa   caa gcg tta aaa aaa   tta gag act cgg gag   gtg gtt   4012
Gln Asn Thr Lys   Gln Ala Leu Lys Lys   Leu Glu Thr Arg Glu   Val Val
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gat ttg tcg aaa tat aaa gca acg   aaa agc gat ttg gag   aca cag att   4060
Asp Leu Ser Lys Tyr Lys Ala Thr   Lys Ser Asp Leu Glu   Thr Gln Ile
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tcc gac tta aac gaa aaa ttg gcc aat ctg aat agg aag tat gag gaa   4108
Ser Asp Leu Asn Glu Lys Leu Ala Asn Leu Asn Arg Lys Tyr Glu Glu
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gta tgt gag gag gtt ttg cat gcc aaa aag aag gaa ctg tct gct aaa   4156
Val Cys Glu Glu Val Leu His Ala Lys Lys Lys Glu Leu Ser Ala Lys
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gat gag aag gaa ttg ctc cat ttc agc ata gag caa gaa atc aaa gat   4204
Asp Glu Lys Glu Leu Leu His Phe Ser Ile Glu Gln Glu Ile Lys Asp
        1260   1265   1270

cag cag gaa cga tgt gac aaa tcc tta aca acc atc acg gag cta cag   4252
Gln Gln Glu Arg Cys Asp Lys Ser Leu Thr Thr Ile Thr Glu Leu Gln
       1275   1280   1285

aga aga ata cag gaa tct gcc aaa caa atc gaa gca aaa gat aat aag   4300
Arg Arg Ile Gln Glu Ser Ala Lys Gln Ile Glu Ala Lys Asp Asn Lys

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ggc ctt tcc cag ctc acc tat gga agt ggg agt ccc agc aag agg cag    4396
Gly Leu Ser Gln Leu Thr Tyr Gly Ser Gly Ser Pro Ser Lys Arg Gln
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agt cag ctg att gac agc ctg cag cag cag gtc agg tcc ctg cag cag    4444
Ser Gln Leu Ile Asp Ser Leu Gln Gln Gln Val Arg Ser Leu Gln Gln
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cag ctg gcg gat gcc gac aga cag cac caa gaa gta att gca att tat    4492
Gln Leu Ala Asp Ala Asp Arg Gln His Gln Glu Val Ile Ala Ile Tyr
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cgg aca cac ctt ctt agt gct gca cag ggt cac atg gat gag gat gtg    4540
Arg Thr His Leu Leu Ser Ala Ala Gln Gly His Met Asp Glu Asp Val
                    1370                    1375                    1380

cag gcc gcc tta ctg cag atc ata cag atg cgg cag ggg ctc gtg tgc    4588
Gln Ala Ala Leu Leu Gln Ile Ile Gln Met Arg Gln Gly Leu Val Cys
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tag tcg gca cccccagcc cacagtggct ttccctgctg gtgctgagca    4637
 *  Ser Ala
    1400


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Gly Lys Leu Asp Val Glu Gly Arg Ser Ala Phe His Val Val Ala Ser
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Lys Gly Asn Leu Glu Cys Leu Asn Ala Ile Leu Ile His Gly Val Asp
65                  70                  75                  80
Ile Thr Thr Ser Asp Thr Ala Gly Arg Asn Ala Leu His Leu Ala Ala
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Lys Tyr Gly His Ala Leu Cys Leu Gln Lys Leu Leu Gln Tyr Asn Cys
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Pro Thr Glu His Val Asp Leu Gln Gly Arg Thr Ala Leu His Asp Ala
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Ala Met Ala Asp Cys Pro Ser Ser Ile Gln Leu Leu Cys Asp His Gly
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Ala Ser Val Asn Ala Lys Asp Val Asp Gly Arg Thr Pro Leu Val Leu
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Ala Thr Gln Met Cys Arg Pro Thr Ile Cys Gln Leu Leu Ile Asp Arg
                165                 170                 175
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Leu Gly Cys Glu Tyr Gly Cys Lys Asp Ala Val Glu Val Leu Ile Lys
        195   200   205
Asn Gly Ala Asp Val Thr Leu Leu Asp Ala Leu Gly His Asp Ser Ser
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Tyr Tyr Ala Arg Ile Gly Asp Asn Leu Asp Ile Leu Thr Leu Leu Lys
225   230   235   240
Thr Ala Ser Glu Asn Ser Asn Lys Gly Arg Glu Leu Trp Lys Lys Gly
            245   250   255
Pro Ser Leu Gln Gln Arg Asn Leu Ser Gln Met Leu Asp Glu Val Asn
            260   265   270
Thr Lys Ser Asn Gln Arg Glu His Gln Asn Ile Gln Asp Leu Glu Ile
        275   280   285
Glu Asn Glu Asp Leu Lys Glu Arg Leu Arg Lys Ile Gln Gln Glu Gln
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Arg Ile Leu Leu Asp Lys Val Asn Gly Leu Gln Leu Gln Leu Asn Glu
305   310   315   320
Glu Val Met Val Ala Asp Asp Leu Glu Ser Glu Lys Glu Lys Leu Lys
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Ser Leu Leu Ala Ala Lys Glu Lys Gln His Glu Glu Ser Leu Arg Thr
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Ile Glu Ala Leu Lys Ser Arg Phe Lys Tyr Phe Glu Ser Asp His Leu
        355   360   365
Gly Ser Gly Ser His Phe Arg Lys Glu Asp Met Leu Leu Lys Gln Gly
    370   375   380
Gln Met Tyr Met Thr Asp Ser Gln Cys Thr Ser Thr Gly Met Pro Val
385   390   395   400
His Met Gln Ser Arg Ser Met Leu Arg Pro Leu Glu Leu Ala Leu Pro
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Asn Gln Ala Ser Tyr Ser Glu Asn Glu Ile Leu Lys Lys Glu Leu Glu
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Ala Met Arg Thr Phe Cys Asp Ser Ala Lys Gln Asp Arg Leu Lys Leu
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Gln Asn Glu Leu Ala His Lys Val Ala Glu Cys Lys Ala Leu Ala Leu
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Glu Cys Glu Arg Val Lys Glu Asp Ser Asp Glu Gln Ile Lys Gln Leu
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Glu Asp Ala Leu Lys Asp Val Gln Lys Arg Met Tyr Glu Ser Glu Gly
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Lys Val Lys Gln Met Gln Thr His Phe Leu Ala Leu Lys Glu His Leu
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Thr Ser Asp Ala Ala Thr Gly Asn His Arg Leu Met Glu Glu Leu Lys
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Asp Gln Leu Lys Asp Met Lys Val Lys Tyr Glu Gly Ala Ser Ala Glu
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Val Gly Lys Leu Arg Asn Gln Ile Lys Gln Asn Glu Met Leu Val Glu
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Glu Phe Lys Arg Asp Glu Gly Lys Leu Met Glu Glu Asn Lys Arg Leu
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Gln Lys Glu Leu Ser Met Cys Glu Leu Glu Arg Glu Lys Arg Gly Arg
            580   585   590
Lys Leu Thr Glu Met Glu Gly Gln Leu Lys Asp Leu Ser Ala Lys Leu
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Ala Leu Ser Ile Pro Ala Glu Lys Phe Glu Asn Met Lys Ser Leu Leu
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Ser Asn Glu Leu Asn Glu Lys Ala Lys Lys Leu Ile Asp Val Glu Arg
625   630   635   640
Glu Tyr Glu Arg Ser Leu Asn Glu Thr Arg Pro Leu Lys Arg Glu Leu
            645   650   655
Glu Asn Leu Lys Ala Lys Leu Ala Gln His Val Lys Pro Glu Glu His

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Glu Gln Leu Lys Ser Arg Leu Glu Gln Lys Ser Gly Glu Leu Gly Lys
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    690                    695                    700
Glu Lys Val Cys Leu Asp Asn Lys Leu Leu Thr Gln Gln Val Asn Asn
705                    710                    715                    720
Leu Thr Thr Glu Met Lys Asn Val Pro Leu Lys Val Ser Glu Glu Met
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Lys Lys Ser His Asp Val Ile Val Asp Asp Leu Asn Lys Lys Leu Ser
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Asp Val Thr His Lys Tyr Thr Glu Lys Lys Leu Glu Met Glu Lys Leu
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Leu Met Glu Asn Ala Ser Leu Ser Lys Asn Val Ser Arg Leu Glu Thr
    770                    775                    780
Val Phe Ile Pro Pro Glu Arg His Glu Lys Glu Met Met Ala Leu Lys
785                    790                    795                    800
Ser Asn Ile Thr Glu Leu Lys Lys Gln Leu Ser Glu Leu Asn Lys Lys
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Cys Gly Glu Asp Gln Glu Lys Ile Tyr Ser Leu Met Ser Glu Asn Asn
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Asp Leu Lys Lys Thr Met Ser His Gln Tyr Val Pro Val Lys Thr His
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Glu Glu Ile Lys Thr Ala Leu Ser Ser Thr Leu Asp Lys Thr Asn Arg
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Glu Leu Val Asp Val Lys Lys Lys Cys Glu Asp Ile Asn Gln Glu Phe
865                    870                    875                    880
Val Lys Ile Lys Asp Glu Asn Glu Ile Leu Lys Arg Asn Leu Glu Asn
                885                    890                    895
Thr Gln Asn Gln Val Lys Ala Glu Tyr Ile Ser Leu Arg Glu His Glu
            900                    905                    910
Glu Lys Met Ser Gly Leu Arg Lys Ser Met Lys Lys Val Gln Asp Asn
        915                    920                    925
Ser Ala Glu Ile Leu Ala Lys Tyr Lys Lys Ser Gln Glu Glu Ile Val
    930                    935                    940
Thr Leu His Glu Glu Ile Ala Ala Gln Lys Arg Glu Leu Asp Thr Ile
945                    950                    955                    960
Gln Glu Cys Ile Lys Leu Lys Tyr Ala Pro Ile Ile Ser Leu Glu Glu
                965                    970                    975
Cys Glu Arg Lys Phe Lys Ala Thr Glu Lys Glu Leu Lys Glu Gln Leu
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Ser Gln Gln Thr Gln Lys Tyr Asn Thr Ser Glu Glu Glu Ala Lys Lys
        995                    1000                   1005
Cys Lys Gln Glu Asn Asp Lys Leu Lys Lys Glu Ile Leu Thr Leu Gln
    1010                   1015                   1020
Lys  Asp Leu Lys Asp Lys Asn Val His Ile Glu Asn Ser Tyr Glu Thr
1025                   1030                   1035                   1040
Glu Arg Ala Leu Ser Arg Lys Thr Glu Glu Leu Asn Arg Gln Leu Lys
            1045                   1050                   1055
Asp Leu Leu Gln Lys Tyr Thr Glu Ala Lys Lys Glu Lys Glu Lys Leu
        1060                   1065                   1070
Val Glu Glu  Asn Ala Lys Gln Thr Ser Glu Ile Leu Ala Ala Gln Thr
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Leu Leu Gln Lys Gln His Val Pro Leu Glu Gln Val Glu Ser Leu Lys
    1090                   1095                   1100
Lys Ser Leu Ser Gly Thr Ile Glu Thr Leu Lys Glu Glu Leu Lys Thr
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Lys Gln Arg Cys Tyr Glu Lys Glu Gln Gln Thr Val Thr Gln Leu Arg
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Gln Met Leu Glu Asn Gln Lys Asn Ser Ser Val Pro Leu Ala Glu His
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Leu Gln Val   Lys Glu Ala Phe Glu Lys Glu Val Gly Ile Ile Lys Ala
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Ser Leu Arg Glu Lys Glu Glu Glu Ser Gln Asn Lys Thr Glu Glu Val
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Ser Lys Leu Gln Ser Glu Ile Gln Asn Thr Lys Gln Ala Leu Lys Lys
1185              1190              1195              1200
Leu Glu Thr Arg Glu  Val Val Asp Leu Ser Lys Tyr Lys Ala Thr Lys
           1205.             1210              1215
Ser Asp Leu Glu Thr Gln Ile Ser Asp Leu Asn Glu Lys Leu Ala Asn
           1220              1225              1230
Leu Asn Arg Lys Tyr Glu Glu Val Cys Glu Glu Val Leu His Ala Lys
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Lys Lys Glu Leu Ser Ala Lys Asp Glu Lys Glu Leu Leu His Phe Ser
     1250              1255              1260
Ile Glu Gln Glu Ile Lys Asp Gln Gln Glu Arg Cys Asp Lys Ser Leu
1265              1270              1275              1280
Thr Thr Ile Thr Glu  Leu Gln Arg Arg Ile Gln Glu Ser Ala Lys Gln
           1285              1290              1295
Ile Glu Ala Lys Asp Asn Lys Ile Thr Glu Leu Leu Asn Asp Val Glu
        1300              1305              1310
Arg Leu Lys Gln Ala Leu Asn Gly Leu Ser Gln Leu Thr Tyr Gly Ser
     ·1315              1320              1325
Gly Ser Pro Ser Lys Arg Gln Ser Gln Leu Ile Asp Ser Leu Gln Gln
     1330              1335              1340
Gln  Val Arg Ser Leu Gln Gln Gln Leu Ala Asp Ala Asp Arg Gln His
1345              1350              1355              1360
Gln Glu Val Ile Ala Ile Tyr Arg Thr His Leu Leu Ser Ala Ala Gln
           1365              1370              1375
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<213> Bos taurus

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<221> VARIANT
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<223> Xaa may be Pro or Ala

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<223> Xaa may be Val or Ile

<221> VARIANT
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<220>
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<220>
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<220>
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<400> 9
gtagctgtaa accattgact                                           20

<210> 10
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<400> 10
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<210> 11
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<220>
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<220>
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<400> 12
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<210> 13
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<220>
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<220>
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cgggatccccc aattcttatg aaacagaaag agca   34

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<400> 24
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